Bi-weekly Wetland and Stream Corridor Restoration Update
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Welcome to the Bi-weekly Wetland and Stream Corridor Restoration Update. This Web site

- Provides current information on wetland and river corridor restoration projects
- Recognizes outstanding restoration projects
- Offers a forum for information sharing

We welcome the submission of articles and announcements related to your restoration project. Just send your write-up to EPA's contractor at restorationupdate@tetratech-ffx.com or mail it to Rebecca Schmidt, Bi-weekly Restoration Update Coordinator, Tetra Tech, Inc., 10306 Eaton Place, Suite 340, Fairfax, VA 22030. We will carefully consider your submission for inclusion in a future update. If your submission is selected, please note that it might be edited for length or style before being posted. Because this Web site is meant to be a public forum on restoration information, we cannot post any information that is copyrighted or information that advocates or lobbies for any political, business, or commercial purposes or has the appearance of doing so.

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Feature Article

The Wetland Initiative Takes on the Largest Wetland Restoration Project in Illinois

Although far from complete, the Hennepin and Hopper Lakes restoration project is already a remarkable success story. The project began in April 2001 when The Wetland Initiative (TWI) facilitated the transfer of the Hennepin Drainage and Levee District to conservation ownership. TWI, a conservation organization founded 8 years ago to restore wetland resources along the Illinois River, worked with private landowners, the Village of Hennepin, and the Hennepin Drainage and Levee District to secure all the land under permanent conservation easement. The funding for this project comes largely from federal Conservation Reserve Enhancement Funds, with additional funding from state easement payments, a $500,000 grant from the North American Wetlands Conservation Act, and foundation grants and private donations.

Nearly a century ago, landowners decided to transform this 2,600-acre complex of wetlands, wet prairies, sedge meadows, marshes, and backwater lakes into agricultural land. They dug ditches to collect and drain surface and ground water. In the 1920s a levee was built along the northern and western edge to keep floodwaters out of the land, and a pumping station was constructed to lift the water over the levee and discharge it to the Illinois River.

TWI's first step toward restoration was to undo these modifications. TWI shut down the pumping station and plugged the drainage ditches. The natural hydrology of the land began to return. Restoration planners involved in the project decided it would be wise to leave the levee in place because years of modifications along the Illinois River had drastically altered the river's water levels. By February 2002, less than a year after the restoration project began, approximately 1,300 acres of land were underwater, and a difference was apparent in Hennepin Lake and Hopper Lake. Their water was clear and native fish had begun to return.

In the first year after the pumping station was shut down and ditches were plugged, native plants returned to the area. Some scientists worried that the natural seed bank might have been damaged by years of agricultural activity, but those worries proved to be unfounded when native wetland plants sprang up in the area. Sago pondweed, smartweed, and other rare wetland species have been seen thriving in the restoration area.

The response by birds has been equally as impressive. Several rare or state-listed threatened species have been seen nesting and breeding in the restored area, including the pied-billed grebe, cattle egret, Franklin's gull, black tern, and bald eagle. More common species spotted in the new wetland included Bonaparte's gull, the red-headed woodpecker, and ducks and geese.

In addition to these early successes, TWI has more planned for the restoration site. Staff from TWI continue to convert former agricultural lands back to native wetlands. To accomplish this, herbicide is being applied to weeds that have sprung up on the dormant fields. In November 2002 TWI plans to seed the area with native grasses. They will establish further species diversity with additional plantings, which will continue through spring 2003. TWI will then manage the area in an attempt to restore the original biodiversity the area exhibited 100 years ago.

Careful attempts will be made to record progress throughout the restoration process. The Hennepin and Hopper Lakes project is being used as a research study to identify cost-effective restoration alternatives. In addition, TWI plans to integrate the project into local educational programs. Opportunities will be created for elementary and secondary school students to visit and study the vegetation and wildlife of the wetland complex. Illinois residents will also benefit from increased opportunities to fish, hike, and enjoy nature.

Information for this article was gathered from literature provided by TWI, an article in the November 18, 2001, issue of the Pioria *Journal Star,* and an article in the Spring-Summer 2002 issue of *Birdscapes*. For more information about the project, contact TWI at 312-922-0777 or twi@wetlands-initiative.org. Information is also available on the TWI web site at www.wetlands-initiative.org under "projects."

If you'd like your project to appear as our next featured article, e-mail a short description to restorationupdate@tetratech-ffx.com.

Five-Star Restoration Projects Update

The goal of EPA's Five-Star Restoration Program is to bring together citizen groups, corporations, the Youth Conservation Corps, students, landowners, and government agencies to undertake projects that restore streambanks and wetlands. The program provides challenge grants, technical support, and peer information exchange to enable community-based restoration projects. A few Five-Star restoration projects are being revisited to see if the modest amount of funding (between $5,000 and $20,000) has helped the local restoration partners achieve their goals.

Project Name: **Galveston Bay Wetland Restoration**
Five Star Grant: **$10,000**
Grant to: **Scenic Galveston, Inc.**
Project Location: **Galveston County, Texas**
Grant Year: **2000**

Original Project Description:
Scenic Galveston will restore and enhance 16 acres of intertidal wetlands at the confluence of Highland Bayou and Galveston West Bay adjacent to Interstate 45. Project partners include the Gulf Coast Bird Observatory, the Galveston Bay Estuary Program, Texas Parks and Wildlife, Reliant Energy, and others. Restoration work involves removing 1 acre of fill material, reestablishing wetland plants, and enhancing tidal flow to 15 acres of degraded wetland to enhance its wildlife values. Another goal of the project is to develop a regional comprehensive management plan for the Galveston Bay System. Funding for this grant is being provided by the Gulf of Mexico Program, which is a partnership underwritten by EPA, and the National Marine Fisheries Service Community-based Restoration Program.

Project Update:
Project earthmoving was substantially complete in mid-December 2000. Aside from the high marsh/upland access roadway strip left at the Reliant Energy HL&P tower crossing, the roadway connecting the new habitat to I-45 has been removed and restored to shallow water and marsh, preserving existing marsh roadside fringe in the vicinity. The old gas-gathering pad was brought primarily to intertidal marsh elevations and subdivided into four sections by deep open-water channels. High spots, or marsh crowns, already present on the pad at appropriate elevations were left in place as bird habitat. By replacing the preexisting concrete rubble sharply delimiting the old square, raised upland pad, a wider, irregularly shaped perimeter of new marsh fringe was created. Fine grading was performed, and clean gravel-clay fill material was pushed into the open water immediately adjoining the pad, muddying the old pad's hard outline and creating a more natural-looking marsh. Since completion of the basic earthmoving, these edges have continued to degrade and soften with tidal action and continued flushing of the new cross channels.

This strategy was applied farther out from the pad in a wide, fan-shaped area of shallow open water surrounding the pad site. Fill material from the old gathering pad was placed in a series of *Spartina alterniflora* marsh planting islands, separated by a network of open water channels.

Scenic Galveston estimates the total acreage of marsh restoration outside the old pad to be at least 7 acres. Coupled with the pad and the enhanced territory between it and the I-45 row, acreage of restored estuarine habitat is estimated at 9 acres in the Scenic Galveston Estuary preserve.

Future efforts include the use of volunteer labor to plant about 2 acres of nursery-grown donated *Spartina alterniflora* at the new site. Scenic Galveston will partner with the Galveston Bay Foundation and Reliant Energy to complete these efforts. **[Updated April 2002.]**

Project Title: **Middlefork Savanna Wetland and Stream Habitat Project**
Five Star Grant: **$10,250**
Grant to: **Youth Conservation Corps, Inc.**
Location: **Lake County, Illinois**
Grant Year: **1999**

Original Project Description:
The Youth Conservation Corps, in partnership with the Lake County Forest Preserves District, Lake Forest Open Lands Association, Friends of the Chicago River, and City of Lake Forest, will engage local youth in restoring portions of the Middlefork of the Chicago River and its wetlands. This project's efforts are part of a watershed-wide effort to improve the quality of this highly urban stream. Benefits of the program include providing work experience, on-the-job training, and conservation education to local youth; increased stream habitat; improved water quality; and flood risk reduction along the river.

Project Update:
This project involved continuing the restoration of the streambanks of the North Branch of the Chicago River and adjacent wetlands. The project included working on 800 feet of streambanks and the Savanna Wetlands located in the Middlefork Savanna Preserve.

Most of the success of this project is the result of the efforts of two Youth Conservation Corps (YCC) crews from Lake County high schools. Accomplishments of the YCC crews include:

- Planting of 6,000 upland/prairie plants
- Planting of 10,000 aquatic plants
- Installation of 10 carp exclosures
- Assisting in the removal of 13 acres of buckthorn
- Painting of a renovated train station that will be used as an education outpost
- Installation of four benches along a trail

Results of the crews' efforts are obvious. Replanting of the river and its streambanks with native species has caused a resurgence in the local flora and fauna. The aquatic and submerged plants were installed along a 2-mile stretch of the river. Carp exclosures were installed and will be removed once the new plant material is established. Great blue herons have been seen feeding in the area, and there has been an increase in the number of frogs making their home in the Chicago River. The major savanna work was done on 400 acres of Lake County Forest Preserve District property. YCC crews cleared the savannas of buckthorn and planted native upland and wetland plants.

Without the YCC crews' help with painting the converted train station and installing four benches on the trail, this project would not have been completed in time for its dedication. **[Updated May 2002.]**

Project Title: **Involving Youth in Salmon Habitat Restoration**
Five-Star Grant: **$10,000**
Grant to: **King County Park System**
Project Location: **King County, Washington**

Original Project Description:
The King County Park System will work with at-risk youth to restore critical salmon habitat along the Sammamish River in northeastern King County. Through this hands-on, interactive work experience, the youth will help complete part of larger watershed restoration effort intended to help long-range salmon recovery. The project will be implemented in partnership with the King County Department of Youth Services, King County Work Training Program, King County World Conservation Corps, Washington Department of Natural Resources, and U.S. Army Corps of Engineers. Partial funding for this grant is being provided by the National Marine Fisheries Service Community-based Restoration Program.

Update:
There was work to be completed by everyone in the Salmon Habitat Restoration project undertaken by the King County Park System. Project partners restored a 1.6-acre waterfront along the Sammamish River where salmon poaching, dumping, and other human activities had degraded river habitat. Youth from the King County World Conservation Corps, Boy Scout Troop 572, and youth offenders under the King County Juvenile Courts Alternatives to Detention Program worked together, using their individual skills to complete the project. Youth from the Conservation Corps, an organization that enlists young adults from King County and around the world to work in environmental resource management, worked with site maintenance planning and pond restoration. The Boy Scouts learned teamwork as they removed nonnative species and installed paths around the site. At-risk youth learned about basic plant identification and planting techniques, and all the participants learned to work together despite their different backgrounds. Cumulatively, the youth volunteers contributed more than 600 hours of labor.

Completion of the project has limited human access to the Sammamish River at the restoration site. The limited access will prevent further degradation of the site by human activities and protect the quality of river habitat necessary for survival of the endangered chinook salmon. To further ensure the quality of the river habitat, community volunteers will monitor the site for 3 years and complete necessary follow-up work as part of the Five-Star project. The project site is also part of a larger "re-leaf" watershed restoration effort designed to educate community volunteers about the importance of watershed restoration and provide the community with restoration opportunities**. [Updated September 2001.]**

Community-Based Restoration Partnerships

Coal Company Teams with Local Students to Restore Riparian Habitat

In early May 2002, employees of Peabody Energy's Powder River Coal Company teamed with Campbell County High School students to restore riparian habitat along Porcupine Creek at the North Antelope/Rochelle Mine, the nation's largest and most productive coal mine. Nearly 50 students and

employees spent the day hand-planting more than 2,200 willows and cottonwoods along a 2-mile streambank as part of "Project Forkhorn," a broad wildlife habitat reclamation program.

"Hand-planting is an important technique because it allows us to look at the micro-topography within our reclamation to determine the best planting locations for hardy, robust growth," said Bryan Hansen, environmental specialist for North Antelope/Rochelle Mine. "Planting willows along the streambank will improve water quality and support a wider diversity of aquatic life. We also expect the improved habitat to attract an increased population of migratory water birds, including mallards and Canada geese."

The team-based work to restore riparian habitat is part of a larger effort to reclaim mined lands for wildlife habitat, as well as livestock grazing. Pronghorn, deer, and elk have found a home in the mine's lease area, and their populations have grown annually for nearly a decade. "We believe in continuous environmental improvement in coal mining and coal use and seek to create valuable resources to benefit future generations," said Greg Dundas, operations manager for North Antelope/Rochelle Mine. "Project Forkhorn embodies these values, while increasing awareness about stewardship of our resources. The students should take great pride in their excellent work, which will leave a lasting legacy."

To date, Project Forkhorn has resulted in the hand-planting of more than 5,000 trees and shrubs on reclaimed lands, with species ranging from Rocky Mountain juniper to Wyoming big sagebrush. Annual environmental monitoring results show that reclaimed lands at North Antelope/Rochelle are typically two times more productive than native range.

Peabody Energy is the world's largest coal company. Its coal products fuel more than 9 percent of America's electricity and more than 2 percent of the world's electricity. For more information see the May 10, 2002, press release at www.prnewswire.com/micro/btu.

Suquamish Tribe Helps Reclaim Shoreline Habitat

While room is being made at Washington's Naval Station Bremerton for huge Nimitz class aircraft carriers, another project in the shadow of the base is making room for a much smaller ocean traveler—threatened Puget Sound chinook salmon. The Suquamish Tribe and the U.S. Navy have restored shoreline habitat at Charleston Beach. The project is mitigation for the "Pier Delta" project, which will allow the Bremerton facility to house two aircraft carriers at the same time.

"Much of this shoreline habitat has been lost in Sinclair Inlet," said Scott Pozarycki, Suquamish Tribal Environmental Program biologist. "Juvenile salmon and forage fish, such as surf smelt—which are important food sources for salmon—benefit most directly from this project."

"Sinclair Inlet has always been an important place for the Suquamish people to fish," said Rob Purser, tribal fisheries director. "This project, which will restore invaluable habitat, is a good example of the dedication of the Suquamish Tribe and the Navy to preserve and restore what is left of habitat on Sinclair Inlet."

More than 14,000 square feet of intertidal habitat has been restored along 300 feet of Sinclair Inlet shoreline. A 3-foot-thick layer of "beach" gravel, conducive to surf smelt spawning, has been laid to approximate the original condition on the beach. Native vegetation was also planted along 500 feet of shoreline.

"An important aspect of this project is the connection between the intertidal and upland habitat," said Pozarycki. "What we tried to do was restore nearshore habitat. That means restoring the beach as well as the upland vegetation so that we have a more complete ecosystem." The native vegetation provides nutrients, shade for forage fish eggs, and habitat for insects, which are an important component of the juvenile salmon diet.

Purser noted that cooperation among the Suquamish Tribe, Navy, Washington Department of Fish and Wildlife, and National Marine Fisheries Service, as well as other agencies, was important for the project's success. "The tribe is happy that we are able to work with the Navy on such an important project," said Purser. For more information, contact: Rob Purser, Suquamish Tribal Fisheries Director, 360-598-3311; Scott Pozarycki, Suquamish Tribal Environmental Program Biologist, 360-394-5257; or Emmett O'Connell, NWIFC, 360-297-6546, eoconnell@nwifc.org. To view a copy of the original press release, see www.nwifc.wa.gov/newsinfo/newsrelsdet.asp?ID=52.

If you are part of an innovative community-based partnership that is working to restore river corridors or wetlands, we'd like to hear from you. Please send a short description of your partnership to restorationupdate@tetratech-ffx.com.

Achieving Restoration Results

Arlington Echo Staff Create Bogs for Education and Storm Water Retention

Chesapeake Bay coastal plain bogs once spread along the banks of the Severn and Magothy rivers in Anne Arundel County, Maryland. The bogs have become so rare that most Maryland residents will live their entire lives without seeing one. Maryland rivers have also suffered from the loss of these rare habitats, because bogs act as nature's kidneys. During rain events, bogs absorb large amounts of runoff water and slowly release it into nearby rivers and streams. In addition, bog plants efficiently trap nutrients and heavy metals present in runoff water.

Arlington Echo, an environmental center in Anne Arundel County, has successfully created two peat bogs to filter runoff water at its facility. Staff and student volunteers built the small bogs. The restoration workers removed the drainage pipe from a stormdrain and dug a hole to create a low area for the bog. The ground was then covered with a rubber liner and filled with sand and sphagnum peat moss. A depression was made in the moss and a second liner installed to create a pond in the center of the bog. Workers placed small and large rocks at the bog's entrance to slow the inflow of water. The project was

completed by volunteers who planted native wetland bog species. To maintain the bog during exceptionally long dry spells, Arlington Echo staff use water collected in rain barrels.

The first pond was completed in June 2001, and almost immediately it demonstrated its storm water-absorbing ability. Several weeks after its completion, a storm dumped more than 3 inches of rain at Arlington Echo. The bog held all but a small trickle of the rainwater. Earlier this summer, the second bog was completed. A small bridge provides access for visitors interested in viewing the bog up close. For more information, read the article on the bog creation in the August 15 issue of *The Capital* at www.hometownannapolis.com/cgi-bin/read/live/08_15-07/TOP or download a Powerpoint presentation on the restoration project from www.chesapeakebay.net/pubs/subcommittee/cesc/doc-arlingtonechobogs-11-01-2001.ppt. (Note: this presentation is large (77 MB) and might be difficult to download.)

Phoenix Rio Salado Habitat Restoration Project Under Way

The City of Phoenix, Arizona, is restoring habitat on 550 acres of a 5-mile stretch of the Salt River. The project is designed to increase the water flow in the Salt River to allow restoration of native grasslands, trees, and wildlife, while preserving the river's flood capacity. As part of the project, the City will build trails for hiking, biking, and horseback riding.

Study Sparked Project

Shortly after the turn of the century, the U.S. Bureau of Reclamation placed dams along the Salt and Verde Rivers, providing a reliable supply of water year-round for the Salt River Valley. Although the dams provided a reliable water supply for the valley, downstream they created a dry, barren river filled with sand and cobbles. Since then, the land along the riverbed has become lined with landfills, sand and gravel pits, and industrial areas interspersed with a few older neighborhoods.

In 1993 the City of Phoenix successfully requested that the U.S. Army Corps of Engineers conduct a restoration study of the Salt River. The Corps determined that the federal government should partner with the City of Phoenix on the $80 million Rio Salado Habitat Restoration Project. In August 1999 Congress authorized matching federal construction funding (65 percent of the project paid for by federal funds) for the Rio Salado project by signing the Water Resources Development Act.

Numerous Benefits Expected

Project construction began in 2000 and is expected to be completed by late 2003. To restore water flow in the river, six wells will pump an average of 6 million gallons per day from a non-potable aquifer directly under the river. Once the water flow resumes, the City will restore streams, ponds, and wetlands along the river. The city will also restore associated plant communities, including stands of cottonwood and willow trees, mesquite groves, and desert grasslands and shrubs. To provide flood control, the project will include a 200-foot-wide, 10-foot-deep low-flow channel designed to carry storm releases of up to 12,200 cubic feet per second. The project is expected to yield numerous benefits, including maximizing habitat value in the Salt River corridor, improving flood control, providing environmental

education opportunities, and providing recreational outlets for area residents and visitors. For more information, see www.ci.phoenix.az.us/NBHDPGMS/riofacts.html or call 602-262-4717.

If you are part of an innovative restoration project that has had positive results, we'd like to hear from you. Please send a short description of your project to restorationupdate@tetratech-ffx.com.

Funding for Restoration Projects

Newman's Own Grants
Grants are awarded annually to organizations that focus on children and youth, health, education, the elderly, the environment, the arts, literacy, substance abuse education, and programs for the needy. US-based 501(c)(3) organizations, schools, hospitals, and other public-benefit institutions are eligible to apply. The application deadline is September 1st. Grant guidelines are available at: www.newmansown.com/5b1_grants.html.

EPA Launches the Watershed Initiative
The Environmental Protection Agency is announcing the kickoff of a new competitive grant program. In celebration of the "Year of Clean Water" and the 30th anniversary of the Clean Water Act, $21 million has been requested for next year's budget for this new watershed initiative. Once the funds are available, the Agency plans to select up to 20 watersheds throughout the country for grants to support promising watershed-based efforts toward cleaner water.

The Agency is officially inaugurating the new program by issuing a call for nominations. Governors and tribal leaders are invited to nominate the most deserving watersheds and accompanying protection or restoration plans to EPA. Proposals will be evaluated using selected EPA criteria, essentially how the infusion of additional funds will help support projects that will readily result in cleaner water. Focusing on results, broad support and partnerships, innovation, and compatibility with other federal or state programs will be key to a successful nomination proposal.

Funding is contingent on approval of the FY 2003 appropriations request for the program. Awards will range from $300,000 to $1,300,000. The deadline for nominations is November 21, 2002. EPA expects to announce selections in January 2003 and complete the grant award process in the spring so that work to improve watershed health can begin as soon as possible. The *Federal Register* notice and other information about EPA's Watershed Initiative can be found on EPA's Web site at www.epa.gov/owow/watershed/initiative.

North American Wetlands Conservation Act: Request for Small Grants Proposals

The U.S. Fish and Wildlife Service and the North American Wetlands Conservation Council are currently entertaining proposals that request match funding for wetland and wetland-associated upland

conservation projects under the Small Grants program. Projects must meet the purposes of the North American Wetlands Conservation Act of 1989, as amended. Funding priority will be given to projects from new grant applicants with new partners, where the project ensures long-term conservation benefits. However, previous Act grantees are eligible to receive funding and can compete successfully on the basis of strong project resource values. Proposals must be postmarked no later than Friday, November 29, 2002. For more information, visit http://birdhabitat.fws.gov.

Please send any news you have on funding mechanisms available to local community organizations to restorationupdate@tetratech-ffx.com.

News and Announcements

Landowners Working to Conserve Bull Trout in Pahsimeroi River Basin, Idaho

On March 26, 2002, the U.S. Fish and Wildlife Service announced that two Idaho landowners have agreed to work with the Service to restore habitat for the threatened bull trout and other aquatic and riparian species in the Pashsimeroi River Basin. Private landowners John Folsom and Ben O'Neal and the Service are formalizing a conservation effort that includes a bull trout Safe Harbor Agreement and an aquatic/riparian habitat restoration project near the mouth of Falls Creek, a tributary of the Pahsimeroi River.

The Falls Creek project would restore 6 miles of stream habitat that has been dewatered from agricultural irrigation diversions for nearly a century. The project would reconnect a population of bull trout that has been isolated in the headwaters of Falls Creek with populations downstream in the Pahsimeroi River. It would also open new migration, spawning, and rearing habitat for bull trout and other resident fish species. In addition, 6 miles of riparian habitat would be restored under the project. These fish habitat benefits would occur while allowing for continued irrigation of agricultural fields through ground water pumping. The Service and others would provide funding assistance to the landowners for the purchase and installation of pumping and sprinkler equipment.

Bull trout were listed as threatened under the Endangered Species Act in 1998. They are negatively affected by impacts on habitat from many sources, including in some cases agricultural irrigation activities. It is hoped that habitat restoration projects such as those proposed on Falls Creek will contribute substantially to the conservation of bull trout and other fish species.

Under the project, Folsom and O'Neal would enter into a Safe Harbor Agreement with the Service to conserve bull trout by returning irrigation flows to Falls Creek. The Bureau of Land Management would assist with this endeavor by implementing stream habitat restoration on its lands, as well as providing technical assistance to neighboring private landowners. The project is not expected to have any impacts on existing ground water resources, but because of the experimental nature of the project, the Service,

BLM, and others will monitor effects on bull trout, aquatic and riparian habitats, and ground water resources, adapting management as necessary.

Safe Harbor Agreements encourage private and other non-federal landowners to implement conservation efforts for listed species by assuring landowners they will not be subjected to additional land use restrictions in the future. A permit would be issued under the Endangered Species Act to Folsom and O'Neal for their agricultural activities in exchange for their commitment to implement the provisions of the Safe Harbor Agreement. The proposed term of the agreement is 20 years. The Service has prepared an Environmental Assessment for approval of the Agreement and issuance of the permit.

Bob Ruesink, the Service's Snake River Basin Office supervisor, said, "The Falls Creek restoration project and bull trout Safe Harbor Agreement are excellent examples of state and federal agencies working with private landowners to further conservation of sensitive and listed species while protecting the needs and rights of landowners. We appreciate the opportunity Mr. Folsom and Mr. O'Neal have provided us to work cooperatively on fish conservation." For more information see http://news.fws.gov/NewsReleases/R1/69338EE2-600E-4ED1-A92079FB3E607822.html or call the Snake River Basin Office at 208-378-5243.

Completion of Anacostia Watershed Restoration Projects Celebrated

On May 28, 2002, Montgomery County, Maryland, Executive Douglas M. Duncan celebrated the completion of eight restoration projects in the Anacostia watershed that repair erosion caused by development and restore fish habitat. This is the first time federal funds have been used in Montgomery County for stream restoration efforts.

"The Anacostia River has consistently been ranked as one of the nation's 10 most polluted rivers, but thanks to a cooperative effort, we have seen substantial improvements," said Duncan. "I am proud of the progress we are making under the Countywide Stream Protection Strategy to restore and rehabilitate our precious water resources. The eight new projects will control storm water runoff from 250 acres of developed watershed and restore and improve fish habitat along 4 miles of stream."

In 1998 the County developed a Countywide Stream Protection Strategy to determine stream conditions based on an assessment of aquatic life and habitat indicators, rather than the more typical measures of stream chemistry. County staff are using the information from this assessment to set priorities and target resources to those watersheds most in need of restoration, preservation and reestablishment of biodiversity. Last month Duncan also announced establishment of a new ground water protection strategy for the County that will put protection of ground water quality and quantity on a par with the County's efforts over the past few years to enhance surface water resources. The policy reflects the need to take aggressive action to protect vulnerable ground water and stream recharge areas.

Eight projects were completed on Anacostia River tributaries in Montgomery County, including Paint Branch, Northwest Branch, Little Paint Branch, and Sligo Creek. Of the $5 million spent on these restoration efforts, the U.S. Army Corps of Engineers provided 75 percent, with the County funding the balance.

At the celebration ceremony, held along Paint Branch, officials observed aquatic habitat improvements that encourage increased populations of brown trout. The project at that location included installation of large rocks, called riprap, along the stream edge to prevent new erosion. Space left between the rocks provides room for fish to hide. New trees were planted; once they are established, their roots will begin to grow into the stream, providing fish habitat. Lunkers, underwater crates without sides, were also installed to provide additional fish habitat.

"Streams are fragile systems, and in a densely populated area such as Montgomery County, they have suffered from the cumulative impacts of prolonged urbanization," said Montgomery County Department of Environmental Protection Director James Caldwell. "Because most of the development occurred when there were no requirements to safeguard streams, we must now undo the resulting damage. Better stream conditions mean a more balanced ecosystem and an improved quality of life for those who live, work, and play in the community."

The following Anacostia watershed projects have been completed:

1. A Paint Branch stream restoration project reduces streambank erosion and enhances stream habitat.

2 & 3. Snowden's Mill I and II storm water management facilities reduce impacts on Paint Branch by controlling storm water flows and enhancing water quality for 211 acres of residential development.

4. Located in the Gum Springs Tributary of Paint Branch, the Gums Springs project decreases storm water flows and thermal impacts in Gum Springs and protects an important trout spawning and nursery area. This project is already producing results: scientists monitoring the Gum Springs tributary have observed a return of brown trout.

5. A stream restoration project downstream of Old Randolph Road reduces streambank erosion and enhances habitat in the Northwest Branch, the largest tributary to the Anacostia River.

6. Located at the end of Lockridge Drive, a second Northwest Branch project stabilizes eroding streambanks and outfalls and creates amphibian habitat.

7. In the Little Paint Branch, the Tanglewood storm water management facility controls storm water flows and enhances water quality for 54 acres of residential development.

8. The Sligo Creek stream restoration project is a continuation of efforts to reduce erosion and enhance stream conditions in Sligo Creek.

Since the original regional Anacostia Restoration Agreement was signed in 1987, Montgomery County has been actively working to restore this watershed, committing nearly $30 million from various sources to acquire stream valley parkland, build capital projects, restore aquatic habitat, help control erosion from over 17 miles of degraded stream, add 350 acres to stream buffers, and provide modern storm water controls to more than 3,250 acres of previously developed lands.

Montgomery County's 6-year capital improvements program budget and supporting state and federal grants commit an additional $25 million to ongoing restoration programs in the Anacostia tributaries and damaged streams in Rock Creek, Cabin John, Little Falls, and other County watersheds.

For more information about the Countywide Stream Protection Strategy or other efforts to improve watersheds in the County, call Montgomery County's Department of Environmental Protection at 240-777-7700 or check the County Web site at www.askdep.com. To view the original press release, see www.co.mo.md.us/news/press/02-212.html.

To post your restoration news and announcements, please send information to restorationupdate@tetratech-ffx.com.

Upcoming Conferences and Events

New Listings

Upcoming Professional Courses on Wetlands by Environmental Concern Inc.

Environmental Concern Inc. (EC), a nonprofit corporation in St. Michaels, Maryland, offers a series of wetland training opportunities for environmental professionals. For more information see www.wetland.org/courses.html. The following are some of the upcoming professional courses:

Stream Restoration
September 10–11, 2002, 9:30 am–5:30 pm, Laurel, Maryland
This 2-day course will provide a thorough introduction to stream restoration using natural channel design strategies. Course material will focus on the basics of river mechanics, stream classification schemes, hydraulic geometry relationships, bankfull discharge, and channel evolution. The course will also explore the design and construction process, focusing on the application of cost-effective techniques for stream restoration and streambank stabilization. Case studies will include projects throughout the East and Midwest, with a special session on lessons learned. Cost: $375.00

Wetland Field Botany
September 19–21, 2002, 9:00 am–5:00 pm, St. Michaels, Maryland
This 3-day course is designed for beginning professionals and other persons wishing to identify wetland species and review basic wetland botany. Key field characteristics of a select number of vascular plant families will be emphasized. Participants will practice keying plants and will identify and discuss numerous species of vascular plants in the field. The course is field-oriented, so prepare to get wet and muddy. Background in botany is not a prerequisite. Cost: $545.00

Wetland Assessment Procedures
September 26–27, 2002, 9:30 am–5:30 pm, Laurel, Maryland
The wetland assessment procedures most widely employed throughout the United States will be introduced in this 2-day course. During a class exercise the most common assessment procedures will be used in a manner that illustrates the approach of each procedure. Participants will practice the decision process for selecting an appropriate functional assessment procedure. Each participant will receive a copy of *A Comprehensive Review of Wetland Assessment Procedures* by Dr. Candy Bartoldus. Cost: $375.00.

Constructed Wetlands for Storm Water and Sanitary Wastewater Treatment
October 09, 2002, 9:30 am–5:30 pm, Laurel, Maryland
This course presents design principles regarding constructed wetlands for the treatment of wastewater. The advantages and limitations of using constructed wetland treatment systems versus conventional treatment methods will be covered. Participants will learn about different wetland treatment systems and treatment efficiencies for both surface and subsurface flow wetlands. Principles of sizing, designing biotic and abiotic wetland components; O&M, and regulatory issues pertaining to discharge standards will be covered. A site visit is included. This course is suggested for professionals interested in low-maintenance and low-cost storm water and wastewater treatment. Cost: $185.00

Wetland Mitigation
October 08–11, 2002, 9:00 am–5:00 pm, Hastings, Michigan
This extensive 4-day course is designed for wetland scientists, consultants, managers, regulators, and restoration practitioners wanting to learn practical aspects of wetland mitigation. The course will offer the opportunity to "stymie the expert" with wetland construction and restoration questions. Topics include USACE/EPA MOA on wetland mitigation; success and failure of wetland compensatory mitigation; establishing goals for compensatory mitigation; basics of wetland hydrology; and preparing, interpreting, and using hydrographs. Hydrologic models for wetland construction, adaptive modes in wetland construction, wetland planting, and basics of wetland soils will be covered. Participants will examine and evaluate several constructed aquatic ecosystems, cover soil amendments, herbivores, weeds, and monitoring. A hydrology exercise, for which participants should bring laptop computers if available, will be conducted. Cost: $785.00.

Evaluation for Planned Wetlands
October 16–18, 2002, 9:00 am–5:00 pm, Lyndhurst, New Jersey
October 23–25, 2002, 9:00 am–5:00 pm, Bordentown, New Jersey
This course is designed to provide an understanding of the Evaluation for Planned Wetlands (EPW) functional assessment procedure. Participants will learn the theory and practical applications for six wetland functions as they pertain to shoreline bank stabilization, water quality, wildlife, fisheries, sediment stabilization, and uniqueness/heritage. Data will be collected from field sites and analyzed with final results compared between group teams. The participants will also be introduced to using EPW in functional wetland design. Teams will prepare conceptual plans and assess the functions to determine whether planned wetland goals have been achieved. The instructor will compare and contrast other wetland evaluation procedures. The course will also cover use of EPW as a mitigation site selection procedure for functional ability. Cost: $575.00

Maine Rivers 5th Annual Fall Conference: Water, What's It For? What's It Worth?

September 14–15, 2002
Bethel, Maine

This conference, presented by Maine Rivers, will present different perspectives on the use and value of water and how we can better protect water's life-giving ability. The conference will offer sessions on effective organization for local watershed groups and land-based strategies to protect river health. A field trip will also be offered to observe current restoration activities taking place along Maine's Androscoggin River. For more information, visit www.mainerivers.org and click on the annual conference link.

9th Annual Virginia Watershed Management Conference

September 25–27, 2002
Roanoke, Virginia

This conference, for local governments, soil and water conservation districts, watershed organizations, interested citizens, and businesses, provides the tools, technologies, and connections to address watershed issues. Some of the topics that will be covered at the conference are natural stream restoration (demonstrated successes presented by national experts), land conservation (local and practical solutions), watershed planning (TMDLs, Chesapeake Bay Agreement), and land use planning (storm water management and other local applications). For more information, visit www.dcr.state.va.us/watershed.

Watershed Management Seminar

September 27–October 13, 2002
Stevens Point, Wisconsin

The University of Wisconsin Stevens Point and USDA Forest Service International Programs will co-sponsor an international course to address issues in watershed management. Senior-level professionals involved in watershed management, conservation, and restoration are encouraged to apply. The seminar will consist of a mixture of instruction and facilitated discussions on watershed management issues. Areas for training and discussion include management technologies, watershed planning, extension and outreach services, stakeholder participation, management partnerships, financial transfer mechanisms for environmental services, and environmental education. For more information, visit www.fs.fed.us/global/is/watershed/welcome.htm.

Previous Listings

Chesapeake Bay Watershed Restoration Conference:
Riparian and Wetland Stewardship
September 24–26, 2002
Baltimore, Maryland

This conference will allow attendees to share critical information regarding watershed conditions, riparian and wetland restoration science, and the tools and techniques used for watershed restoration. Much information applies to wetlands nationwide. Topics focus broadly on assessment and characterization of watershed conditions; riparian and wetland restoration science; and approaches, tools, and techniques for protection and restoration. For more information please contact Hannah Kirchner at 812-723-0088, e-mail hannahk@kiva.net, or visit the Potomac Conservancy Web site at www.potomac.org. The conference is sponsored by the Potomac Watershed Partnership (Ducks Unlimited, USDA Forest Service, Maryland Department of Natural Resources, Virginia Department of Forestry), in conjunction with the Chesapeake Bay Foundation and Stroud Water Research Center.

To post information about upcoming conferences and events, please e-mail restorationupdate@tetratech-ffx.com.

Restoration-Related Web Sites

www.weemscreek.org
Weems Creek Conservancy. The Weems Creek Conservancy was established in 1982 to preserve, restore, and improve the Weems Creek Watershed in Annapolis and Anne Arundel County, Maryland. This site provides information about what people can do to help protect their local watershed. The projects page provides information on rain barrels, rain gardens, and bay-friendly lawns. *This Web site provides simple, useful steps landowners can take to protect their watershed.*

www.dnr.state.md.us/wildlife/bogs.html
Coastal Plain Bogs. The Maryland Department of Natural Resources hosts this page that describes the basic biology of a coastal bog. It gives a brief description of plants commonly found in a coastal bog as well as a list of animals and insects. It also provides a brief description of the history of coastal bogs in Maryland, the threats they currently face, and steps to protect and improve the health of coastal bogs. *This site would be useful for anyone seeking information about the inhabitants of coastal bogs and how to protect them.*

www.bayweekly.com/year02/issueX32/leadX32.html
Rain Gardens in Dry Times. The August 8 issue of *Bay Weekly* on this Web site provides an overview of two different types of rain gardens in Maryland—one in a residential area and another in a business park. The article discusses the basics of rain garden construction and design and highlights the ability of

rain gardens to reduce pollutants in runoff water before it enters streams and rivers. The site also provides links to other rain garden resources. *This Web site would be useful to anyone wishing to implement a rain garden program to prevent pollution from entering the waterways.*

www.nawcp.org
North American Waterbird Conservation Plan. The vision of the North American Waterbird Conservation Plan is to preserve and restore the diversity and abundance of waterbird habitat throughout North and Central America and the Caribbean. The web site provides lists of species common in North and Central America, regional waterbird conservation maps, and regional waterbird training and events. *This Web site would be useful to anyone seeking to conserve or restore habitat useful as waterfowl habitat area.*

www.potomac.org/growingnative/index-partners.htm
The Potomac Watershed Partnership. The Partnership is a collaboration involving federal, state, and local efforts to restore the health of the land and waters in the Potomac River Basin. The Web site features a page for the Growing Native program. This program encourages schools throughout the Potomac River Basin to compete in gathering hardwood seeds for use in watershed and riparian reforestation efforts. *This Web site provides an innovative idea on how to get the community involved in a riparian reforestation effort.*

www.blackwellscience.com/journals/ecology/index.html
Restoration Ecology. This online journal, published quarterly, contains articles on experimental, observational, and theoretical studies dealing with ecological restoration. Many freshwater and saltwater wetland restoration projects are highlighted. A subscription is required to view on-line articles. *This Web site would be useful for people directly involved in restoration to gain current scientific information on restoration types and practices.*

www4.ncsu.edu/unity/users/s/shear/public/research.htm
Restoration Ecology Program Graduate Student Research. This page features current and recently completed graduate research projects by students in North Carolina State University's Restoration Ecology program. Studies on wetland restoration practices and their effectiveness are featured on this page. All project descriptions contain an abstract and literature review. Some recently completed project descriptions include preliminary data and analysis. *This Web site provides information on new research being conducted in the field of wetland restoration.*

http://plant-materials.nrcs.usda.gov
NRCS Plant Materials Program. This program seeks to solve environmental problems through the effective use of plants. The Plant Materials Program develops improved plants and plant technology for natural resources conservation and shares this technology by working with NRCS field offices and other cooperators. *This Web site would be helpful for anyone seeking assistance in choosing and obtaining vegetation for their wetland or streambank restoration project.*

www.stream.fs.fed.us/index.html
Stream Systems Technology Center. This Web site, maintained by the US Forest Service's Rocky Mountain Experiment Station, provides a variety of general stream information. It features the complete

list of *Stream Notes* that have been published since 1995. These quarterly newsletters feature articles on reducing sediment loads in streams, protecting wetland improvement investments, and a variety of other wetland and streambank restoration-related topics. *This Web site would be useful for anyone looking for current information on problems that arise with wetland and streambank restoration projects.*

www.monolake.org
Mono Lake Basin Restoration. This Web site describes efforts to restore California's Mono Lake Basin, much of which was degraded or destroyed as a result of diversions of water to Los Angeles. The site provides historical and current political and ecological basin information and offers a photo gallery and Web cam of sites of interest in the Mono Lake Basin, *This site would be useful for anyone interested in learning about efforts to restore degraded water bodies in areas with limited water supply.*

Let us know about your restoration-related Web site. Please send relevant URLs to restorationupdate@tetratech-ffx.com.

Information Resources

Restore Your Shore
by the Minnesota Department of Natural Resources and the Hennepin Conservation District

The Minnesota Department of Natural Resources and the Hennepin Conservation District recently developed *Restore Your Shore*, a CD-ROM targeted at lake property owners who want help with landscaping and protecting water quality. *Restore Your Shore* is a multimedia learning experience that guides users through the process of protecting natural shorelines or restoring a degraded shore with a natural landscape buffer. It is full of information, imagery, interactive exercises, stories, music, and more. Users can learn how to curb erosion, provide fish and wildlife habitat, and promote cleaner, healthier lakes. *Restore Your Shore* may be purchased through Minnesota's Bookstore in St. Paul (651-297-3000) or at the Hennepin Conservation District (763-420-2157). For more information, see www.hcd.hennepin.mn.us/HCDNEW.data/Components/news/CD-ROM.html.

***Integrated Streambank Protection Guidelines*, 2002**
by the Washington Department of Fish and Wildlife, Washington Department of Transportation, and Washington Department of Ecology

Washington State's Integrated Streambank Protection Guidelines (ISPG), available for download at www.wa.gov/wdfw/hab/ahg/strmbank.htm, provide advice for the selection and design of streambank protection techniques that protect or restore aquatic and riparian habitats. The ISPG describes mechanisms and causes of streambank failure (general bank erosion, scour, avulsion, mass failure, subsurface entrainment), shear, vertical distribution of shear, habitat, risk, site- and reach-based assessment, channel form, channel process (equilibrium and disequilibrium), duration and extent of

impacts (construction, lost habitat, etc.), lost opportunity, emergency bank protection, and decision-making matrices for selecting appropriate solutions.

Living With Wetlands: A Handbook for Homeowners in Northeastern Illinois
by The Wetlands Initiative

This 24-page, full-color guidebook describes wetland types common in Illinois, outlines laws protecting wetlands, and provides basic conservation measures homeowners can use to protect wetlands. The guide discusses the establishment of native vegetation strips, reducing chemical use, and maintaining septic systems. The handbook also provides the names and numbers of numerous organizations that could answer questions about wetlands or help homeowners establish native plants on their property. The book can be obtained by contacting the Wetlands Initiative at 53 West Jackson Boulevard #1015, Chicago, IL 60604. Phone: 312-922-0777; e-mail: twi@wetlands-initiative.org; Internet: www.wetlands-initiative.org.

Wetland Publications
Minnesota Board of Water and Soil Resources offers a series of wetland publications for download or viewing on its Web site (http://www.bwsr.state.mn.us/wetlands/publications/index.html), including brochures on wetlands and wetland regulation in Minnesota, a report titled *Native Vegetation in Restored and Created Wetlands*, and others.

If you'd like to publicize the availability of relevant information resources, please send information to restorationupdate@tetratech-ffx.com.